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PROVISIONAL SPECIFICATION.

Improvements in or relating to Brewing and the Production of Alcoholic Beverages.

We, FRANK FAULKNER, of The Laboratory, Bath Row, Birmingham, in the County of Warwick, Consulting Brewer, JAMES EDWARD JOHNSON JOHNSON, F.I.C., F.C.S., of Crown Works, Marsh Gate Lane, Stratford, in the County of Essex, Manufacturing Chemist, and THE NON-DEPOSIT BEER COMPANY, LIMITED, of 5 N.D.B. Works, 69A, Bath Row, Birmingham, in the County of Warwick, do hereby declare the nature of this invention to be as follows:—

- This invention has for objects the production of a wort of a highly dextrinous or gummy and gas retaining quality, and the production of alcoholic beverages having a sparkling and foaming character and free from sediment or solid matter.
- 10 According thereto milled malt—i.e., grist, is mashed with liquor that is at a temperature of about 177° F. and so as to obtain a mixture heat of about 160° F. and to the resulting mash mixture is added a suitable quantity of a malt-extract that is rich in the active enzymes of malted grain and such for example as the malt extract known as "Edme" malt extract. The mashing can be carried out
- 15 in the manner and by the means usually adopted, the mashing liquor being at or about the temperature mentioned instead of at the usually much lower temperature, and the malt extract being added to the resulting mash at any suitable stage of the mixing process or after sparging. In this way there is obtained a brilliant wort of a highly dextrinous or gummy and gas retaining quality.
- 20 To convert the wort thus obtained into beer it is boiled in a copper with hops in the usual way, fermented and cleansed. The resulting beer is afterwards racked into clean and specially strong casks with an addition of hops for dry-hopping the beer which is carefully stored for a suitable time, say about a week, in the casks which are rolled from time to time, say about three times a day for
- 25 a few minutes at a time. In this way the beer becomes highly charged with gas due to renewed fermentation, the gas being retained by the highly dextrinous nature of the beer. The casks with their contents are then removed to a cool or refrigerating room or compartment and kept for a suitable time, say about three weeks, at a temperature of about 30° F., the casks being rolled daily at intervals
- 30 so that the gas resulting from cask fermentation becomes re-dissolved in the beer.

The cold, quiescent, and gas saturated beer is finally filtered into casks, jars, bottles or other suitable receptacles by the aid of filtered air or other fluid under pressure, through a filter the filtering material in which is of a close nature and

35 such as will not injuriously affect the quality of the beer. We have found that pulped cellulose, preferably in the form of compressed blocks or plates, forms

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a very advantageous filtering material for the purpose mentioned. As will be obvious some of our improvements may be used without others.

Dated this 28th day of June 1898.

For the Applicants,

W. LLOYD WISE,
46, Lincoln's Inn Fields, London, W.C.,
Chartered Patent Agent.

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COMPLETE SPECIFICATION.

**Improvements in or relating to Brewing and the Production of
Alcoholic Beverages.**

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We, FRANK FAULKNER, of The Laboratory, Bath Row, Birmingham, in the County of Warwick, Consulting Brewer, JAMES EDWARD JOHNSON JOHNSON, F.I.C., F.C.S., of Crown Works, Marsh Gate Lane, Stratford, in the County of Essex, Manufacturing Chemist, and THE NON-DEPOSIT BEER COMPANY, LIMITED, of N.D.B. Works, 69A, Bath Row, Birmingham, in the County of Warwick, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

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This invention has for objects the production of a wort of a highly dextrinous or gummy and gas retaining quality, and the production of alcoholic beverages having a sparkling and foaming character and free from sediment of amorphous description.

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According thereto milled malt—i.e., grist, is mashed with liquor that is at a temperature of about 177° to 180° F. and so as to obtain a mixture heat of about 160° F., and to the resulting mash mixture is added a suitable quantity of a malt-extract that is rich in the active enzymes of malted grain and such for example as the malt extract known as "Edme" malt extract. In practice satisfactory results have been obtained by adding about 112 parts by weight of "Edme" malt extract to about 5,000 parts by weight of the mash mixture. The mashing can be carried out in the manner and by the means usually adopted, the mashing liquor being at or about the temperature mentioned instead of at the usually much lower temperature, and the malt extract being added to the resulting mash at any suitable stage of the mixing process, or during or after sparging. In this way there is obtained a brilliant wort of a highly dextrinous or gummy and gas retaining quality.

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To convert the wort thus obtained into beer, it is boiled in a copper with hops in the usual way, fermented and cleansed. The resulting beer is afterwards racked into clean and specially strong casks, which may have been lined with paraffin wax or other suitable material. The beer, to which hops, say in the proportion of about one half pound to each barrel, have been added, is carefully stored for a suitable time, say about a week, the casks being rolled from time to time, say about three times a day for a few minutes at a time. In this way the beer becomes super-saturated with gas due to renewed primary fermentation, the gas being retained by the highly dextrinous nature of the beer. The casks with their contents are then removed to a cool or refrigerating room or compartment and kept for a suitable time, say about three weeks, at a temperature of about 30° F., the casks being rolled daily at intervals, say twice a day for a few minutes at a time, so that the gas resulting from cask fermentation becomes completely dissolved in the beer.

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The cold, quiescent, and gas saturated beer is finally filtered into casks, jars, 50

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bottles or other suitable receptacles by the aid of filtered air or other fluid under pressure, through a filter the filtering material in which is of a close nature and such as will not injuriously affect the quality of the beer. We have found that pulped cellulose, preferably in the form of compressed blocks or plates, with or without admixture of asbestos, forms a very advantageous filtering material for the purpose mentioned.

During the process of filtration, it is preferred to employ a counter-pressure of say about one half to three-quarters of an atmosphere of air or gas, preferably carbonic acid gas, the gas pressure in the cask being say one or one and one half atmosphere, and to employ a filling machine having duplicate cylinders to control the extent of beer fobbing and render the bottle filling process more or less automatic.

Figs. 1 and 2 of the accompanying illustrative drawings show respectively in end elevation and cross section, a filter and Fig. 3 shows in front elevation, a bottle filling machine, suitable respectively for filtering and bottling beer produced according to this invention.

The filtering material consists of compressed blocks or plates 1 of pulped cellulose, or a mixture of pulped cellulose and asbestos, held in place in an ordinary manner between plates 2 and 3 that are respectively formed with small and large perforations, the combined blocks or plates 1 of filtering material and the supporting plates 2 and 3 therefor, being fixed in place within a suitable casing 4 that is provided with an inlet pipe 5 for the beer to be filtered, and with an outlet pipe 6 for the filtered beer. When a mixture of cellulose and asbestos is used, suitable proportions are 90 parts by weight of cellulose to 10 parts by weight of asbestos, but the proportions can be varied. In the example shown, the inlet pipe 5 is formed by a hollow trunnion that is connected to the central space 4^a between the plates, and to a pipe 6 that is provided with a valve 7 and a glass vessel 8 having a pressure gauge 8^a and is connected to a supply pipe 9 for connection to a cask or other vessel from which the beer to be filtered and bottled is forced by gaseous or other pressure. 10 are vent cocks. The outlet pipe 6 is connected by the branched passage 11 with the end compartments 12, 12^a of the filler case 4 and by a flexible pipe 13 to the lower end of a filling cylinder 14 that is in connection through a cross pipe 15 and common longitudinal pipe 16 with a number of filling nozzles 17 of a bottle filling machine, the said nozzles being each formed with a circumferential opening or openings controlled by a tap or other valve and through which beer can escape and descend along the inner surface of the bottle to be filled (when the bottling tap is opened), and with a central outlet pipe 18 through which air can escape from the bottle whilst the same is being filled with beer, as in bottling machines of known construction. The several outlet pipes 18 extend to the upper part of the cylinder 14 which is connected to a second cylinder 19 provided at 20 with an outlet normally closed by a valve 21 that is pressed against its seat by a suitably weighted lever 22, both cylinders, which may be of glass, or of metal with gauge glasses, being provided with pressure gauges 23. The movable bottle supports 24 and the means for carrying and operating the same, are of known construction.

With the arrangement described it will be seen that if the supply and delivery pipes 9 and 6 of the filter be connected respectively with a cask containing beer under gaseous pressure and the bottle filling machine, and the valve 7 be opened, then as the air cannot readily escape from the cylinders 14 and 15 of the bottle filling machine, such air will set up a counter-pressure to the direct pressure of the beer passing through the filter and also to that of the beer entering a bottle that is being filled, whereby the filtering and filling operations are enabled to be carried out in a more advantageous manner than heretofore the extent of such counter-pressure being capable of ready regulation, to suit requirement, by merely adjusting the position of the weight on the lever 22.

It is to be understood that the above described improved means of filtering

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and bottling beer is not herein separately claimed as forming part of the present invention as we intend to obtain separate Letters Patent in respect thereof and is only herein referred to in order to explain the best way known to us of filtering and bottling beers produced according to this invention.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. The production of a wort of a highly dextrinous or gummy and gas retaining quality by mashing malt with liquor at a temperature of about 177° to 180° F. and so as to obtain a mixture heat of about 160° F. and adding to the resulting mash mixture a malt extract rich in the active enzymes of malted grain as set forth. 10
2. The production of alcoholic beverages having a sparkling and foaming character and free from sediment by converting wort produced according to the preceding claim into beer, racking the beer thus obtained into casks with an addition of hops, storing the beer for a suitable time at ordinary temperatures and afterwards at a low temperature and agitating it from time to time, and finally filtering it into casks or other receptacles as set forth. 15

Dated this 24th day of March 1899.

For the Applicants,

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W. LLOYD WISE,
46, Lincoln's Inn Fields, London, W.C.,
Chartered Patent Agent.